**Opening Session**  
**Monday, June 14**  
Castleman Hall  
9:00 a.m. - 10:15 a.m.

**Symposium Chairman:** Jerry C. Tien, UMR  
**Welcome Speech:** John T. Park, Chancellor, UMR  
**Keynote Speech:** Health and Safety Issues for the Mining Industry  
R. Larry Grayson, Associate Director, NIOSH, Washington, D.C.

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**Plenary Session**

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<th>I. Ventilation Systems</th>
<th>Monday, June 14</th>
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<td><strong>Chairman:</strong> Malcolm McPherson, Virginia Polytechnic Institute and State University</td>
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*Developments in Longwall Ventilation*  
Jürgen F. Brune, Joseph P. Aman, and Mike Kotch, CONSOL, Inc., Pittsburgh, PA.  

*Ventilation System Design for a Thin-seam Mining Panel*  
Darren W. Holman, Ian M. Loomis, and Malcolm J. McPherson, Virginia Polytechnic Institute and State University, Blacksburg, VA.  

*Replacement of a Major Ventilation Raise at the Homestake Gold Mine*  
Justus B. Deen, John R. Marks, and LeEtta M. Shaffner, Homestake Mining Co., Lead, SD.  

*Effects of Drilling Small Diameter Exhaust Shafts in a Gassy Longwall Operation*  
T. Coleman, Joseph F. Brune, and Mike Kotch, CONSOL, Inc., Pittsburgh, PA.  

*Ventilation-on-Demand: Quantity or Quality – A Pilot Trial at Barrick Gold’s Bousquet Mine*  

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<th>II. Longwall Safety</th>
<th>Monday, June 14</th>
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| **Chairman:** Fred N. Kissell, NIOSH  
Ian Duckworth, Mine Ventilation Services, Inc. |

*Gas Emission Control on Longwall Panels at the Vorkuta Coal Mines*  
V.N. Bobrovnikov, Coal Research Institute, O.I. Kazanian, Saint-Petersburg State Mining Institute (Technical University), and A.P. Veselov, Coal Mining Stock Company, Vorkuta, Russia.  

*An Investigation of Longwall Gob Gas Behavior and Control Methods*  
Steve J. Schatzel, J.C. LaScola, F.E. McCall, and P.W. Jeran, NIOSH, Pittsburgh, PA.  

*Mining Safety of Longwall Top-coal Caving in China*  
Jian Wu and Yueping Qin, China University of Mining Technology, Beijing, and Minghua Zhai, Zangdi Coal Mine, Xuzhou, China.  

*Water Injection in Longwall Top-coal Caving Face in China*  
Yong Zhang and Gui Fu, China University of Mining and Technology, Beijing, China.  

*Characteristics of Airborne Dust in the Return Airways of the Mechanized Longwall Face*  
Tevfik Gıyagüler and Sinan Keskin, Middle East Technical University, Ankara, Turkey.

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<th>III. Methane and Methane Control</th>
<th>Monday, June 14</th>
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| **Chairman:** Richard Ray, Parsons Brinkerhoff Quade & Douglas  
Jay Vilseck, MSHA |

*Mitigation of Methane Emissions from Coal Mine Ventilating Air*  
F. Peter Carothers, Alternative Energy Development, Inc., Silver Spring, MD and Milind D. Deo, University of Utah, Salt Lake City, UT.  

*The General Characteristics of Electromagnetic Radiation during Coal Fracture and Its Application in Outburst Prediction*  
Xue-qiu He, En-yuan Wang, and Zhentang Liu, China University of Mining and Technology, Jiangsu, China.  

*Scale Tests In-situ Measurements and Simulation of Methane Gas Distribution at Heading Faces*  
Shinsuke Nakayama, Masatomo Ichinose, Kenichi Uchino and Masahiro Inoue, Kyushu Kyoritsu University, Fukuoka, Japan.  

*A New Laboratory Technique to Estimate Gas Diffusion Characteristics of Coal*  
Satya Harpalani and Shaofan Ouyang, The University of Arizona, Tucson, AZ.  

*Increased Methane Emissions for Mechanical Miners Working in Burnt Coal*  
A.P. Cook, Africa, Ltd., Johannesburg, South Africa.  


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<th>IV. Methane Drainage</th>
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| **Chairman:** Stephen Hardcastle, CANMET  
Eric Quam, Marston and Marston |

*The General Characteristics of Electromagnetic Radiation during Coal Fracture and Its Application in Outburst Prediction*  
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*Increased Methane Emissions for Mechanical Miners Working in Burnt Coal*  
A.P. Cook, Africa, Ltd., Johannesburg, South Africa.  


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Recovery of Methane from the Abandoned Golden Eagle Mine Property Ken Hupp, Stroud Oil, Wichita, KS, Carol Bibler, and Raymond C. Pilcher, Raven Ridge Resources, CO.


Economic Analysis of Coalbed Methane Drainage Systems for Room-and-Pillar Operations Yanbei Wang and Jan M. Mutmansky, The Penn State University, University Park, PA.


V. Face Ventilation Monday, June 14
UC-East B
3:30 a.m. - 5:00 p.m.

Chairman: William Kennedy, Kennedy Metal Products Kirk McDaniel, WIPP Project - Westinghouse

Ventilating the Box Cut of a Two-Pass 40-ft Extended Cut Edward D. Thimons, Charles D. Taylor, and Jeanne A. Zimmer, NIOSH, Pittsburgh, PA.

Methane Ignition on Roof Bolters in Underground Coal Mines William J. Francart and John E. Urosek, MSHA, Pittsburgh, PA.

Comparison of Methane Concentrations at a Simulated Coal Mine Face During Bolting Edward Thimons, Charles D. Taylor, and J.A. Zimmer, NIOSH, Pittsburgh, PA.

A Proposed New Method to Determine the Effectiveness of In-Heading Methane Control F.J. van Zyl, CSIR, Johannesburg, South Africa.

Methane Concentration at Heading Faces with Auxiliary Ventilation Shinji Tomita, Kenichi Uchino, and Masahiro Inoue, Kyushu University, Fukuoka, Japan.

VI. Dust and Diesel Control - I Tuesday, June 15
UC-East A
8:30 a.m. - 10:15 a.m.

Chairman: Christopher J. Pritchard, Tg Soda Ash
Ian Loomis, Virginia Polytechnic Institute and State University


Dust Control at Yucca Mountain Project Fred N. Kissell, NIOSH, Pittsburgh, PA, R. Jurani, R. Dresel, and C. Reaux, M & O Morrison Knudsen Corp., Las Vegas, NV.

Control of Silica Dust in Slate Milling Operations Karl T. Ahlen, Robert A. Haney and Joseph Denk, MSHA, Pittsburgh, PA.

Effectiveness of Cabs for Dust and Silica Control on Mobile Mining Equipment Joseph Garcia, Ronald E. Gresh, Mary Beth Gareis and Robert A. Haney, MSHA, Pittsburgh, PA.

Lowering Respirable Dust Exposures at Mineral Processing Facilities Andrew B. Cecala, Robert J. Timko, and Edward D. Thimons, NIOSH, Pittsburgh, PA.

VII. Dust and Diesel Control - II Tuesday, June 15
UC-East B
8:30 a.m. - 10:15 p.m.

Chairman: Jan. M. Mutmansky, Penn State University
Mike Zuber, Hoditch & Associates

Measurements of Dust Extraction Effectiveness on a Testing Stand Walenty Frydel and Marcin Steindor, KOMAG Mining Mechanization Centre, Gliwice, Poland.

Methods for Dust Removal in Roadway Sections Walenty Frydel and Marcin Steindor, KOMAG Mining Mechanization Centre, Gliwice, Poland and Robert A. Jankowski, NIOSH, Pittsburgh, PA.

The Influence of Coal Physical and Mechanical Properties and Mining Energy Consumption Factor on Airborne Respirable Dust Level Antoni Koziel and Malgorzata Malec, KOMAG Mining Mechanization Centre, Gliwice, Poland, and Ewa Wardas, Rybnicka Coal Joint Stock Co., Rybnik, Poland.

Considerations for Estimating Remote Operator Dust Exposure Using Fixed-Point Samples on Continuous Mining Sections Jeffrey M. Listak, Gerrit Goodman, and Robert Jankowski, NIOSH, Pittsburgh, PA.

Laboratory Evaluation of Pressure Differential Based Respirable Dust Detector Tube Jon Volkwein, April L. Schoeneman, and Steven J. Page, NIOSH, Pittsburgh, PA.

VIII. Diesel and Diesel Control Tuesday, June 15
UC-East A
10:30 a.m. - 12:00 p.m.

Chairman: Jürgen F. Brune, CONSOL, Inc.
Daniel Brunner, Resource Enterprises


An Integrated Approach to Control Diesel Particulate Matter in Underground Coal Mines Pramod Thakur and
Larry D. Patts, CONSOL, Inc., Morgantown, WV.

Proposed Regulation on Diesel Particulate Matter in Underground Coal Mines Thomas F. Tomb, MSHA, Pittsburgh, PA.

NIOSH/NCI Study of Exposure to Diesel Exhaust in Underground Mines – An Industry Perspective Christopher J. Pritchard, Tg Soda Ash, Inc., Granger, WY.


IX. Heat and Humidity Tuesday, June 15
UC-East B
10:30 a.m. - 12:00 p.m.

Chairman: John R. Marks, Homestake Mining Company
Alan Hall, University of British Columbia

Computer Simulation of Climatic Conditions for Underground Automated Mines for Standard and Reduced Airflow Requirements Julian Partyka, Laurentian University, Stephen Harcastle, and Charles Kocsis, Laurentian University, Sudbury, Canada.


Personal Cooling in Hot Workings Michael A. Tuck, University of Ballarat, Victoria, Australia.

Non-Destructive Field Measurements of Rock Temperature and Heat Flow in a Hot Mine Vilen P. Chernyak, Eduard N. Malashenko, Institute of Engineering Thermophysics, Kiev, UKRAINE and Pierre Mousset-Jones, Mackay School of Mines, Reno, NV.

Rapid Evaluation of Rock Thermal Parameters at the Lucky Friday Mine Ian J. Duckworth, Mine Ventilation Services, Inc., Fresno, CA.

X. Climatic Control Tuesday, June 15
UC-East A
1:30 p.m. - 3:15 p.m.

Chairman: Pierre Mousset-Jones, Mackay School of Mines
Charles Taylor, NIOSH

Novel Approach to the Energy Analysis of Mine Cooling Strategies C.T. Twort, I.S. Lowndes and S.J. Pickering, University of Nottingham, Nottingham, United Kingdom.

Control of Heat and Humidity in German Mines Wolfgang Schlotte, DMT-Gesellschaft für Forschung und Prüfung mbH, Essen, Germany.

Performance Assessment of a Multi-Stage Cooling System at San Manuel Mine Kuda R. Mutama, BHP Copper, Inc., San Manuel, AZ.

Mathematical Description of Air Cooling Using A Mini-
ing Diaphragme Cooler Taking into Consideration the Condensation of Water Vapour Wacław Dziurzyński, Stanislaw Nawrat, Bernard Nowak and Janusz Roszkowski, Polish Academy of Sciences, Cracow, Poland.

XI. Mine Explosion Tuesday, June 15
UC-East B
1:30 p.m. - 3:15 p.m.

Chairman: John E. Urosek, MSHA
Donald Mitchell, Consultant


Rapid Extinguishing of Sponcom Fires in Underground Mines Zygmunt Kajdasz, Central Mines Rescue Station, Poland and George Zieba, Bartim Pty, Ltd, Australia.

Three Underground Coal Mines Explosions – Twenty One Miners Killed – One Reason Andrzej M. Wala and Jason R. Stoltz, University of Kentucky, Lexington, KY.


Shock Waves Generated in the Presence of Barriers in Gas Explosions Baiquan Lin and Shining Zhou, China University of Mining and Technology, Jiangsu, China.

XII. Mine Fire and Fire Detection Tuesday, June 15
UC-East A
3:30 p.m. - 5:00 p.m.

Chairman: Promad Thakur, CONSOL, Inc.
Lineas Laage, MSHA

CFD Analysis of Mine Fire Smoke Spread and Reverse Flow Conditions J.C. Edwards and C.C. Hwang, NIOSH, Pittsburgh, PA.

Recovery of Minerales Monclova Minas V Patrick Graham, William Marston, Donald Mitchell, John W. Stevenson and David Sullivan Consultants, Hoover, AL.

Modeling of Gob Inertization with Nitrogen Michael Michaylov and Elena Vlassieva, University of Mining and Geology, Sofia, Bulgaria.


Method for Operative Prediction of SPONCOM Hazard in Gob Area Michael Michaylov, University of Mining & Geology “St. Ivan Rilski”, Sofia, Bulgaria.

Spontaneous Combustion in the Gob of Fully Mechanized Longwall Top-Coal Caving Face Jingcai Xu, Deng Jun, Xingming Guo, and Fu Wen, Xi’an Mining Institute, Xi’an, China.
XIII. Mine Fans

**Chairman:** John Kelleher, *Schauenburg Corporation*
Felipe Caliza, *P.T. Freeport Indonesia*

**Installation of Two Main Fans at P.T. Freeport Indonesia’s Underground Facilities**
Felipe Calizaya and A. Mulyadi, P.T. Freeport, Indonesia.

**Theoretical Analysis of Jet Fan Performance Using Momentum and Energy Considerations**
Kuda R. Mutama, BHP Copper, Inc., San Manuel, AZ, and Allan E. Hall, University of British Columbia, Vancouver, Canada.

**Axial Flow Fan Use at San Manuel Mine**
Kuda R. Mutama and Dave P. Pelletier, BHP Copper, Inc., SMO, San Manuel, AZ.

**The Application of Variable Frequency Drives to Mine Fans**
Robert Z. Smith, ABB Garden City Fan, Niles, MI.

**On Criteria of Stability of Fans Operating in Parallel**
Jerzy Krawczyk, Cracow, Poland.

**Anti-Stall Fans for the Mining Industry**
Phil Blankenship, ABB Garden City Fan, Richlands, VA.

**Improving the Ventilation Efficiency of Jet Fans in Longitudinally Ventilated Rectangular Ducts**
Eddy Jacques and Pierre Wauters, Unité TERM & Université Catholique de Louvain, Belgique.

Banquet Speech
**Tuesday, June 15**
Dr. Rudolf E. Greuer
**UC-East B**
8:00 p.m. - 9:00 p.m.

**The Practice of Ventilation Planning Half a Century Ago**

XIV. Mine Monitoring and Control

**Chairman:** Thomas McNider, *Jim Walter Resources*
Regula Bhaskar, *University of Utah*

**Evaluation of Different Airflow Sensors at the WIPP Facility**

**A Navigating System for Ventilation Network Spatio-Temporal Control**
Yuusaku Tominaga, Hokkaido University, Sapporo, Japan.

**Expert System for Mine Fire Monitoring and Fire-Fighting**
Waclaw Dziurzynski and Stanislaw Wasilewski, Strata Mechanics Research Institute, Leopolda, Poland.

**Axial Fan Monitoring by Pressure Transients Close to the Blades, a Preliminary Study**
Ian M. Loomis and Shaun P. Ramsay, Virginia Polytechnic Institute and State University, Blacksburg, VA.

High Speed Monitoring and Control System Uses Windows-NT
Albert E. Keter, Rel-Tek Corp., Monroeville, PA.

XV. Ventilation Modeling

**Chairman:** Stewart Gillies, *University of Kentucky*

**Validation of Computational Models of Auxiliary Ventilation Systems with Experimental Data**
K.W. Moloney, D.M. Hargreaves, W. Pearce, University of Bristol, and I.S. Lowndes, University of Nottingham, Nottingham, United Kingdom.

**Simulation of Airflow Expansion Requirements for an Exhaust Raise Common to Two Mines**
E. De Souza and L. Götz, Queen’s University, Kingston, Canada.

**ENVIRON 2.5 – A Mine Ventilation and Cooling Network Simulation Tool**
W.M. Marx, CSIR Mining Technology, Auckland Park, South Africa.

**CFD Applications in Tunnel Ventilation Analysis**

**AutoCAD Based Mine Ventilation Analysis**
Ted Sartain, Jim Walters Resource, Brookweek, AL, and Don Scheck, Ohio Automation, Inc., Athens, OH.

**Radiological Modeling Software for Underground Uranium Mines**
B. Bjorndal, and R. Moridi, CAIRS, Saskatchewan, Canada.

XVI. System Optimization

**Chairman:** Kieth Wallace, *Mine Ventilation Services, Inc*
William Lane, The Doe Run Company

**Optimization of the Ventilation System at Kidd Creek Mine of Falconbridge, Limited**
Josef Sedlacek, Falconbridge, Limited, Ontario, Canada.

**Optimization of Main Exhaust Fan Systems at Battle Mountain Gold Ltd., Golden Giant Mine**
László Götz, Battle Mountain, Canada, Ltd. and Euler De Souza, Queen’s University, Ontario, Canada.

**Increasing Energy Efficiency of Mine Ventilation Systems**
Riyaz Papar, Lawrence Berkeley National Laboratory, Washington, D.C., Andrew Szady, Oak Ridge, TN, William Huffer, Warsaw, IN, Vern Martin, Canada, and Aimee McKane, Washington, D.C.

**Ventilation Network Optimization for Deep Mines**

**Genetic Algorithm Optimization of a Large U.K. Coal Mine Ventilation Network**
Zhi-yuan Yang, I.S. Lowndes
and B. Denby, University of Nottingham, Nottingham, United Kingdom.

XVII. Health and Safety Wednesday, June 16
UC-East B
10:30 a.m. - 12:00 p.m.

Chairman: Edward J. Miller, MSHA
Satya Harpalani, University of Arizona

MSHA Approval Process David Chirdon, MSHA, Tridelphia, WV.


An Integrated Strategy for Emergency Egress from an Underground Metal Mine Rick Brake, Laval University, Québeck, Canada.


XVIII. Miscellaneous Topics Wednesday, June 16
UC-East A
1:30 p.m. - 3:15 p.m.

Chairman: Peter Christensen, BHP Minerals, Int’l
David Johnston, New Philadelphia Fan Co.

Mine Safety in Chinese Coal Mines: Today and Tomorrow Xintan Chang and Yunsiu Sai, Xi’an Mining Institute, Xi’an, Shaanxi Province, China.

Equivalent Roughness and Its Application in Calculating Friction Drag of Mine Roadway Yan Zhou and Xingshen Wang, China University of Mining and Technology, Xuzhou, Jiangsu Province, China.

A Comparison of Air Leakage Prediction Techniques for Auxiliary Ventilation Ducting Systems A.D. Stewart Gillies and Hsin Wei Wu, The University of Queensland, Brisbane, Australia.


XIX. Miscellaneous Topics-II Wednesday, June 16
UC-East B
1:30 p.m. - 3:15 p.m.

Chairman: Robert A. Haney, MSHA
Albert Ketler, RelTek Corp.

Mines Mark Butterworth, CSIR, Auckland, South Africa.

Direct and Inverse Problem of Diffusion with Simultaneous Linear Accumulation Petko Ivanov Lalov, University of Mining and Geology, Sofia, Bulgaria.


XX. Panel Discussion Wednesday, June 16
Mine Fire and UC-East A
Fire Detection 3:30 p.m. - 5:00 p.m.

Moderator: John Urosek, MSHA
Rudolf Greuer, Michigan Tech. University

XXI. Panel Discussion Wednesday, June 16
Mine Ventilation UC-East B
Education Issues 1:30 p.m. - 3:15 p.m.

Moderator: Pierre Mossett-Jones, Mackay School of Mines
Michael Tuck, University of Ballarat, Victoria

Controlled Recirculation in Deep South African Gold